

## AMENDMENTS

1. (Currently Amended) A method of identifying fault conditions in an automation system, comprising the steps of:

identifying components and sensors in the system,  
identifying inputs ~~and outputs~~ to each identified component, ~~the inputs including possible fault conditions and other inputs,~~  
receiving outputs from said sensors;  
determining functional relationships between the inputs and outputs for each identified component, and  
determining a weight value for a possible fault condition for each component based on said functional relationship;  
determining fault conditions from said possible fault conditions based on ~~the functional relationships and the outputs and other inputs~~ said weight values.

2. (Currently Amended) The method of claim 1, further comprising the step of using the identified inputs and outputs of a specific component and sensors and the functional relationships of a corresponding generic component to identify the fault conditions.

3. (Previously Presented) The method of claim 2, further comprising the step of defining component libraries that describe the functional relationships of the generic components.

4. (Previously Presented) The method of claim 2, further comprising the step of creating a diagnostic program from the functional relationships of the generic components associated with each component.

5. (Previously Presented) The method of claim 4, further comprising the step of transforming the functional relationships into fault conditions.

6. (Previously Presented) The method of claim 5, wherein the step of transforming is implemented in an off-line phase during which the diagnostic program is created, and an on-line phase during which available inputs and outputs are supplied to the transformed functional relationships in the control program, to identify fault conditions.

7. (Canceled)

8. (Previously Presented) The method of claim 1, further comprising the step of including state information for at least one of the components to define the state of the component at a different time.

9. (Currently Amended) A method of defining diagnostic code for an automation system, comprising the steps of:

identifying the functional elements and associated sensors of the system;

defining inputs ~~and outputs~~ for each of the functional elements ~~including defining fault conditions as inputs~~;

receiving outputs from said associated sensors

defining functional relationships between ~~outputs~~ inputs and associated ~~inputs~~ outputs for each functional element; and

expressing the functional relationships using a programming language;

determining a weight value for a possible fault condition for each functional element based on said functional relationship;

determining fault conditions from said possible fault conditions based on said weight values.

10. (Previously Presented) The method of claim 9, wherein the programming language is a symbolic language.

11. (Previously Presented) The method of claim 9, wherein the step of defining functional relationships for at least some of the functional elements includes utilizing a component library

that defines the functional relationships between inputs and outputs of at least one generic element.

12. (Previously Presented) The method of claim 11, wherein the step of defining the functional relationships includes the step of defining functional relationships and inputs and outputs of the generic elements corresponding to the functional elements in the system.

13. (Previously Presented) The method of claim 9, further comprising the step of including state information for at least one of the components to define the state of the component at a different time.

14. (Canceled)

15. (Canceled)

16. (Canceled)

17. (Canceled)

18. (Canceled)

19. (Canceled)